

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1. (Currently amended) A photo-catalyst containing titanium fluoride nitride comprising,  $\text{Ti(IV)O}_a\text{Nb}_b\text{F}_c$  or a compound represented by  $\text{MeTi(IV)O}_a\text{Nb}_b\text{F}_c$  prepared by doping at least one metal Me selected from the group consisting of alkali or alkaline earth metals on  $\text{Ti(IV)O}_a\text{Nb}_b\text{F}_c$ , wherein, [b]  $\underline{b}$  is 0.1 to 1, [c]  $\underline{c}$  is 0.1 to 1 and [a]  $\underline{a}$  is a value to maintain Ti(IV) and is decided in relation to [b]  $\underline{b}$  and [c]  $\underline{c}$ .

2. (Original) The photo-catalyst containing titanium fluoride nitride of claim 1 to which at least one promoter selected from the group consisting of Pt, Ni and Pd is loaded.

3. (Original) The photo-catalyst containing titanium fluoride nitride of claim 1, wherein  $\text{Ti(IV)O}_a\text{Nb}_b\text{F}_c$  possesses anatase structure and  $\text{MeTi(IV)O}_a\text{Nb}_b\text{F}_c$  possesses perovskite to anatase structure.

4. (Original) The photo-catalyst containing titanium fluoride nitride of claim 3 to which at least one promoter selected from the group consisting of Pt, Ni and Pd is loaded.

5. (Currently amended) A photo-catalyst for water splitting containing titanium fluoride nitride comprising,  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$  or a compound represented by  $\text{MeTi(IV)O}_a\text{N}_b\text{F}_c$  prepared by doping at least one metal Me selected from the group consisting of alkali or alkaline earth metals on  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$ , wherein, [b]  $\underline{b}$  is 0.1 to 1, [c]  $\underline{c}$  is 0.1 to 1 and [a]  $\underline{a}$  is a value to maintain Ti(IV) and is decided in relation with [b]  $\underline{b}$  and [c]  $\underline{c}$ .

6. (Original) The photo-catalyst for water splitting containing titanium fluoride nitride of claim 5 to which at least one promoter selected from the group consisting of Pt, Ni, Ru and Pd is loaded.

7. (Previously presented) The photo-catalyst for water splitting containing titanium fluoride nitride of claim 5, wherein  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$  possesses anatase structure and  $\text{MeTi(IV)O}_a\text{N}_b\text{F}_c$  possesses perovskite to anatase structure.

8. (Original) The photo-catalyst for water splitting containing titanium fluoride nitride of claim 7 to which at least one promoter selected from the group consisting of Pt, Ni and Pd is loaded.

9. (Previously presented) A method for preparation of a photo-catalyst represented by  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$ , wherein a, b and c are

same as to claim 1 by baking titanium di-ammonium fluoride halide represented by  $(\text{HH}_4)_2\text{TiF}_d\text{X}_{6-d}$ , wherein, d is integer of 1-6, which contains at least F and ammonium halide by the ratio of equimolar or by the ratio of slightly excess of ammonium halide at the maximum temperature from 200 to 500 so as to form a starting material, then said starting material is nitrogenated by thermal synthesis in ammonia atmosphere containing from 0.02% to 10.00% of oxygen, air or water to ammonia by reduced mass to oxygen atom at the maximum temperature from 350 to 700 for over than 5 hours.

10. (Previously presented) A method for preparation of a photo-catalyst represented by  $\text{SrTi(IV)O}_a\text{Nb}_b\text{F}_c$ , wherein, a, b and c are same as to claim 1, by baking titanium di-ammonium fluoride halide represented by  $\text{TiF}_x\text{X}_{6-x}$  and/or  $(\text{HH}_4)_2\text{TiF}_d\text{X}_{6-d}$ , wherein x and d are integer of 1-6, which contains at least F and at least one compound selected from the group consisting of  $\text{SrO}$ ,  $\text{SrOH}$  and  $\text{SrX}$  so as to form a starting material or  $\text{SrTiF}_6$ , then said starting material or  $\text{SrTiF}_6$  is nitrogenated by thermal synthesis in ammonia atmosphere containing from 0.02% to 10.00% of oxygen, air or water to ammonia by reduced mass to oxygen atom at the maximum temperature from 350 to 700 for over than 5 hours.

## CLAIMS

1. A photo-catalyst containing titanium fluoride nitride comprising,  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$  or a compound represented by  $\text{MeTi(IV)O}_a\text{N}_b\text{F}_c$  prepared by doping at least one metal Me selected from the group consisting of alkali or alkaline earth metals on  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$ , wherein, b is 0.1 to 1, c is 0.1 to 1 and a is a value to maintain Ti(IV) and is decided in relation to b and c.
2. The photo-catalyst containing titanium fluoride nitride of claim 1 to which at least one promoter selected from the group consisting of Pt, Ni and Pd is loaded.
3. The photo-catalyst containing titanium fluoride nitride of claim 1, wherein  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$  possesses anatase structure and  $\text{MeTi(IV)O}_a\text{N}_b\text{F}_c$  possesses perovskite to anatase structure.
4. The photo-catalyst containing titanium fluoride nitride of claim 3 to which at least one promoter selected from the group consisting of Pt, Ni and Pd is loaded.
5. A photo-catalyst for water splitting containing titanium fluoride nitride comprising,  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$  or a compound represented by  $\text{MeTi(IV)O}_a\text{N}_b\text{F}_c$  prepared by doping at least one metal Me selected from the from the group consisting of alkali or alkaline earth metals on  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$ , wherein, b is 0.1 to 1, c is 0.1 to 1 and a is a value to maintain Ti(IV) and is decided in relation with b and c.
6. The photo-catalyst for water splitting containing titanium fluoride nitride of claim5 to which at least one promoter selected from the group consisting of Pt, Ni, Ru and Pd is loaded.
7. The photo-catalyst for water splitting containing titanium fluoride nitride of claim 5, wherein  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$  possesses anatase structure and  $\text{MeTi(IV)O}_a\text{N}_b\text{F}_c$  possesses perovskite to anatase structure.

8. The photo-catalyst for water splitting containing titanium fluoride nitride of claim 7 to which at least one promoter selected from the group consisting of Pt, Ni and Pd is loaded.

9. A method for preparation of a photo-catalyst represented by  $\text{Ti(IV)O}_a\text{N}_b\text{F}_c$ , wherein a, b and c are same as to claim 1, by baking titanium di-ammonium fluoride halide represented by  $(\text{HH}_4)_2\text{TiF}_d\text{X}_{6-d}$ , wherein, d is integer or 1-6, which contains at least F and ammonium halide by the ratio of equimolar or by the ratio of slightly excess of ammonium halide at the maximum temperature from  $200^\circ\text{C}$  to  $500^\circ\text{C}$  so as to form a starting material, then said starting material is nitrogenated by thermal synthesis in ammonia atmosphere containing from 0.02% to 10.00% of oxygen, air or water to ammonia by reduced mass to oxygen atom at the maximum temperature from  $350^\circ\text{C}$  to  $700^\circ\text{C}$  for over than 5 hours.

10. A method for preparation of a photo-catalyst represented by  $\text{SrTi(IV)O}_a\text{N}_b\text{F}_c$ , wherein a, b and c are same as to claim 1, by baking titanium di-ammonium fluoride halide represented by  $\text{TiF}_x\text{X}_{6-x}$  and/or  $(\text{HH}_4)_2\text{TiF}_d\text{X}_{6-d}$ , wherein x and d are integer of 1-6, which contains at least F and at least one compound selected from the group consisting of  $\text{SrO}$ ,  $\text{SrOH}$  and  $\text{SrX}$  so as to form a starting material or  $\text{SrTiF}_6$ , then said starting material or  $\text{SrTiF}_6$  is nitrogenated by thermal synthesis in ammonia atmosphere containing from 0.02% to 10.00% of oxygen, air or water to ammonia by reduced mass to oxygen atom at the maximum temperature from  $350^\circ\text{C}$  to  $700^\circ\text{C}$  for over than 5 hours.